UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS
2007 ANNUAL REPORT




UNIVERSITY OF CALIFORNIA
AGRICULTURE & NATURAL RESOURCES
COOPERATIVE EXTENSION KERN COUNTY

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Kern County Farm and Home Advisors

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Table of Contents

Who We Are and What We Do

Cooperative Extension is the informal off-campus educational arm of the University of California. We are a part of the Land-Grant College System that, since 1914, has provided the citizens of California and Kern County with programs to improve their quality of living. Our informal educational programs have focused on: (1) agriculture and natural resources; (2) family and consumer sciences; (3) community resource development; and (4) 4-H youth development.

In Kern County, we are most commonly recognized as the Farm and Home Advisors Office. Cooperative Extension advisors are your local representatives of the University of California and the resources of the institution are as close as your telephone and a local call.

We have over 3,000 different University, USDA, and locally produced publications, most of which are provided with little or no charge. Advisors are available for consultation on your particular problem at no charge.

Cooperative Extension provides homeowners and urban gardeners information on a wide variety of subjects such as gardening, home orchards, house plants, pest control, diagnosis of problems, etc.

- The **4-H Youth Program** is locally administered through the Cooperative Extension Office. Over 1,200 Kern County youth between kindergarten and age 19 are currently enrolled. Over 400 adult volunteer leaders assist with this program.

- **Farm advisors** with various commodity and livestock assignments work primarily with commercial agriculture to improve production and quality, and to enable consumers to enjoy a reasonably priced, wholesome and nutritional food supply. Their experience and knowledge are extended to the urban public through publications and consultations.

- **Environmental Horticulture**. Shade trees and turfgrass make city and suburban areas more livable. The environmental horticulturist provides problem-solving information related to ornamental plants and home fruit and vegetable production. A Master Gardener program provides further education and outreach opportunities.

- The **Nutrition, Family, and Consumer Science Advisor,** using the "Train the Trainer" model, instructs professionals, agency staff, and community volunteers to conduct a broad array of family and consumer education programs. These include money management, parenting, lead poisoning prevention, and family literacy. The Nutrition, Family Consumer Science Advisor also answers consumers' questions regarding food safety and food preservation.

- An **Expanded Food and Nutrition Education Program** is directed at those families near and below the poverty income level. The main thrust of this program is teaching nutrition, food preparation and shopping skills. The Youth EFNEP program provides nutrition curriculum and training to schools serving low-income children.

Letter from the Director

Darlene Liesch, County Director

A couple of things came to mind as I was reading this annual report. Typically, the Farm and Home Advisors Department is a little known department in the larger County system. Although we are a small department, we are complicated. We have multiple funding sources and both County and University staff. Sometimes we are hard to find because we have another name: the University of California Cooperative Extension. This past year has shown me that although we are small and sometimes complicated, we provide an abundance of programs, research and service to the citizens of Kern County.

Many hours were spent at the end of the year participating in the County Strategic plan and performance measures updates. During that process, I realized that our department was able to provide a report of accomplishments for most of the County strategic goals – from improved air quality to 4-H activities for at-risk youth.

As you read this Annual Report, you too will see the depth and breadth of our department. Our advisors not only work on current problems that our clientele have identified, they look to the future. This is across the board. Solving current agricultural problems, such as spider mites or mealybugs, today help our growers and our economy. Looking at and testing new varieties of grapes or tomatoes enables us to have an abundant food supply in the future. Nutrition education for families means healthier Kern County residents now and in the future. Reaching our children with positive choices now gives us a stronger community in the future.

This annual report gives a brief look at the research and programs that our University of California advisors and staff have undertaken this year. Most of the research is a multi-year proposition. That is where vision is so important. And our advisors have that vision. If you want more information about the department or the research and programs, please check our website, visit our location, send us an email or give us a call.

We are the University of California in our community, dealing with local concerns now and looking forward to a healthy and prosperous future for the citizens of Kern County.

Darlene Liesch
County Director

THE UNIVERSITY OF CALIFORNIA
LET THERE BE LIGHT
1868

Citrus, Pistachios and Subtropical Crops

Craig Kallsen, Farm Advisor

Program Description:

The Kern County Farm Advisor for subtropical horticulture is responsible for research and an educational outreach program for Kern County growers and pest control advisors of citrus (approximately 60,000 acres) and pistachios (approximately 60,000 acres) primarily, as well as for miscellaneous permanent crops such as persimmons, pomegranates, olives and figs.

Projects/Applied Research:

EXTENSION AND IMPACTS OF THE PISTACHIO CULTIVAR EVALUATION PROJECT

Evaluation of germplasm for potential new varieties for the California pistachio industry continues. The project is a cooperative effort among University of California Cooperative Extension farm advisors, Dr. Dan Parfitt, a U.C. Agricultural Experiment Station Pomologist; Dr. Ted DeJong, a professor in the University of California Department of Pomology and several cooperative growers and pistachio nut processors in Kern and Madera Counties. Two experimental advanced selection trials were established in Kern County in 2002 with cooperating growers. This year, 2007, was the first year with sufficient harvestable yield for evaluation in these plots. These advanced selections were bred in Kern County and at the University of California at Davis. Several selections in these two new trials appear promising. In the older trials, Golden Hills, released for cultivation by the University of California in 2005, continues to perform well. Golden Hills, also bred and selected in Kern County, appears to be an especially promising addition to Kerman, the current standard industry variety. In continuing evaluation trials, Golden Hills has yield and many nut quality characteristics equal to or better than Kerman and is ready for harvest two weeks earlier. This earlier harvest should increase the efficiency of the pistachio harvest by extending the harvest season, reducing peak demand for labor, harvesting equipment and nut processing facilities. Navel orangeworm, a major pest of pistachio, is primarily a late-season problem. The earlier harvest of Golden Hills should reduce or eliminate the pesticide required for its control in many Kern County orchards. Acreage of Golden Hills continues to increase in Kern County, especially as more budwood becomes available to growers.

Mechanically harvesting a pistachio variety test plot in Kern County in September 2007.

IMPACTS OF DEFICIT IRRIGATION ON FRUIT YIELD AND QUALITY PARAMETERS OF NAVEL ORANGE

Kern County is known for its production of early-maturing oranges. To ensure a minimum level of quality, oranges may not be picked until the rind has reached a legally-defined level of orange color, and the juice a minimum concentration of sugar and acid. In the second year of this experiment, the effects of deficit irrigation on Beck navel orange yield and quality are becoming apparent. In this experiment, beginning in late August less irrigation is applied than an orchard would normally require. The resulting degree of stress applied to the trees is being carefully monitored through plant water potential, applied water and soil-water storage measurements. This experiment is delineating the tradeoffs encountered among yield and fruit quality parameters when growers may be forced to reduce irrigation due to drought or may want to experiment with reduced water application to promote an earlier harvest for greater profit. Two years of results suggest that deficit irrigation can increase the rate of development in the fruit of orange color, sugar, and acid but at the expense of decreased yield and fruit size.

FUKUMOTO NAVEL ORANGE DECLINE

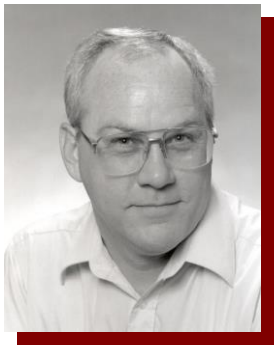
Kern County navel orange growers are limited to just a few early-maturing varieties. The Fukumoto navel, a selection from Japan released to California growers in the late 1980s, produces a fruit prized by packers for its deep orange color, smooth skin, large size and shape. Unfortunately, individual trees in many orchards and entire orchards in a few cases have exhibited poor tree health and tree decline. Research conducted over the past five years in groves in Kern and Tulare Counties and at the U.C. Research and Extension Center at Lindcove suggests that incompatibility between the Fukumoto scion and common rootstocks used in California citriculture may be the problem. All of the Fukumoto navel trees now growing in the Central Valley, and the trees used in our research can trace their ancestry to a few Fukumoto trees located in the Foundation Block at the Lindcove Research and Extension Center. Recently, growers in Spain have increased their plantings of Fukumoto navel on a rootstock that is associated with decline problems in California. However, they report no decline problems, even though the location in Spain where Fukumoto navel is being cultivated has a similar climate to Kern County. The original Spanish budwood source is a few trees located at a U.C. facility in Riverside, California. Our next step is to obtain trees grown from budwood at the Riverside facility and compare the growth and development of these trees with trees grown from buds from the U.C. Lindcove Foundation Block in a Kern County location.

Fukumoto tree decline: Fukumoto navel orange on the left and a different navel variety on the right.

Cotton, Corn and Small Grains

Brian Marsh, Farm Advisor

Program Description:



As Farm Advisor, responsibilities include the development and implementation of educational programs and applied research projects to address short and long term goals to meet clientele needs. Commodity areas include cotton, corn and small grains. As Shafter Research and Extension Center Director, responsibilities include managing Center resources to support the Division's research and educational objectives.

Projects/Applied Research:

WHEAT VARIETY TRIALS

The 2007 California wheat crop was 608,000 acres including 65,000 acres of Durum wheat. Acreage in Kern County was 90,000 acres, valued at almost $32 million. This was the largest wheat planting since 2004. Continued strong demand and higher grain and silage prices are expected to push wheat acreage up more in 2008.

Cereal grain variety evaluations for common and Durum wheat were conducted at multiple locations throughout California including a site in Kern County. The tests include commercially available varieties and advanced breeding lines. Varieties were evaluated for:

- Yield Potential
- Disease Resistance
- Lodging
- Grain Quality

Results/Impacts:

Results for these variety trials are very important to growers as they select which variety to plant. The measured factors are the most critical in making varietal selections. The decrease or loss of resistance to stripe rust (see picture) renders that variety less desirable.

Change in resistance for Summit:

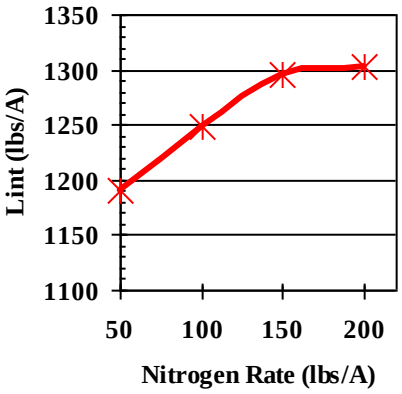
- 2005 – Moderately Resistant
- 2006 – Moderately Susceptible
- 2007 – Highly Susceptible

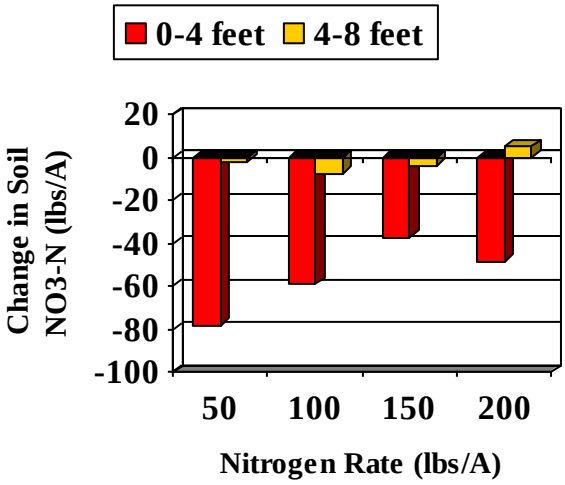
Planted acreage of Summit has decreased from 210,000 acres in 2004 to 79,000 acres in 2007 as its resistance to stripe rust decreased. Other varieties with better disease resistance were planted instead.

NITROGEN FERTILIZATION IN COTTON

A multi-year, multi-location study looked at nitrogen needs for cotton. Factors to be considered with nitrogen fertilization are:

- Avoiding waste in inputs and associated costs.
- New varieties.
- Environmental concerns regarding fate of applied materials and the potential for leaching losses.
- Changes in crop rotations.
- Nitrogen impacts on:
  - potential interaction with insects.
  - preparation for defoliation.
  - balance between vegetative and reproductive growth.
  - delays in harvest and impacts on quality.





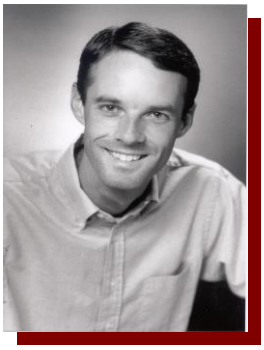
Results/Impacts:

- Adequate nitrogen fertilizer is needed for efficient cotton production.
- Acala cotton plants require 100 lbs of nitrogen per bale of lint produced.
- Half of that amount is removed in the seed.
- Cotton is an efficient user of soil nitrogen.
- Cotton roots can extract nutrients from 4 to 8 feet deep in the soil.
- Soil nitrogen pools are "mined" at low fertilizer nitrogen rates.
- All sources of nitrogen (fertilizer, residual soil nitrogen, irrigation water) need to be accounted for when making fertilizer recommendations.
- Over fertilization can cause nitrogen to be moved below the effective rooting zone.
- Results are highly dependent on soil characteristics, irrigation amounts and leaching potential, crop rotation, yield potential, and soil nitrogen pools (organic and inorganic).
- Fertilizer recommendations must be made with realistic yield goals.
- Soil testing is an important component of nitrogen management.

Entomology and Pest Management

David Haviland, Farm Advisor

Program Description:



The Kern County Entomology Advisor is responsible for research and education programs related to insect pest management in the southern San Joaquin Valley. These programs focus on the development of integrated pest management (IPM) strategies that are safe, effective and economically practical. Where possible, special emphasis is given to the development of strategies that rely on biological and cultural controls that don't require the use of pesticides. In cases where pesticides are needed, research and extension programs focus on how to utilize newer, reduced-risk products in a judicious manner as alternatives to the more toxic organophosphate, carbamate and pyrethroid insecticides that dominated during the past few decades.

The Kern County Entomologist has the responsibility of being knowledgeable on issues related to insect pest management on all commodities grown in Kern County. He uses this knowledge to advise growers and pest control advisors on the best management strategies available. Where information is incomplete or lacking he develops research programs, either on his own or in conjunction with a network of UC entomologists and other researchers, to help solve the problem. This is particularly true for situations where new exotic pests arrive in Kern County for the first time.

Applied Research - 2007 Highlights:

BIOLOGY AND MANAGEMENT OF GILL'S MEALYBUG IN PISTACHIOS

This year was the third and final year of our research on this new exotic pest of pistachios. During the first two years of research we developed data on mealybug biology, biological control and chemical control. This year we finalized work on economic injury levels for this pest that help growers decide at which density of mealybugs a treatment is warranted. These data were utilized to put together a comprehensive IPM program that is now being used by nearly 100% of the farmers statewide that are dealing with this pest.

PACIFIC SPIDER MITE CONTROL IN ALMONDS

Spider mites are one of the most important pests of almonds in California. Recently, growers have been given an opportunity to gain the upper hand against this pest due to the registration of eight new, reduced-risk miticides. Our role has been to evaluate these miticides, including their strengths and weaknesses in a wide range of situations, and determine the best use of each. To date our information has helped determine that growers no longer need preventative treatments of abamectin in the spring, and that alternatives to propargite—and the serious worker safety issues that exist with this product—are now available and effective.

BIOLOGY AND MANAGEMENT OF CITRUS THRIPS IN BLUEBERRIES

Blueberries are one of the newest crops being grown in the San Joaquin Valley. Unfortunately, citrus thrips—a pest previously only known to damage citrus in the valley—has adopted blueberries as its newest host crop. During the past two years we have documented the effect on the crop and conducted research that is leading to an integrated pest management program based on the use of resistant varieties, sampling programs, treatment thresholds, non-chemical controls such as high pressure water, and chemical controls. These management programs are being incorporated into growers' practices as they become developed and disseminated.

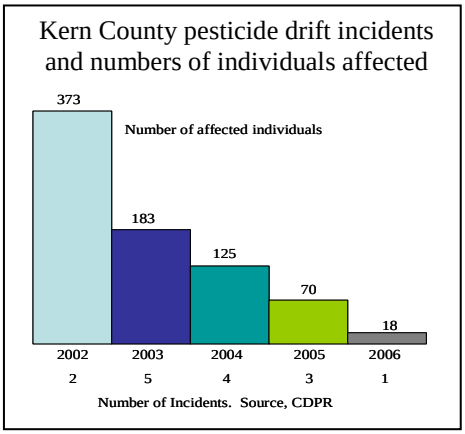
LEAFFOOTED BUG MANAGEMENT IN ALMONDS

During 2007 we did research on a sporatic pest of almonds (leaffooted bug) that wreaked havoc on San Joaquin Valley almond growers during 2006. Our work helped define varietal differences in the type and severity of damage that can occur and seasonal differences in how the crop is affected. This information, coupled with favorable winter weather conditions, helped almond growers keep the damage from this pest to near undetectable levels in 2007.

Extension and Education Programs - 2007 Highlights:

REDUCING CASES OF HUMAN EXPOSURE TO PESTICIDES IN KERN COUNTY

For the past three years the Kern County Entomologist has teamed up with the Agricultural Commissioner's office to provide a series of trainings that focused on the prevention of incidents of human exposure to pesticides. To date a total of 31 trainings have been offered that have educated over 1,000 individuals (mostly private applicators) and allowed 203 individuals (mostly farm labor contractors) to become certified on how to provide effective worker protection training. During the period of this project Kern County drift incidents have reduced from 4 to 1 per year, with the numbers of individuals affected decreasing from 125 to 18 per year.



Summary of other extension activities:

During the past year, the Kern County Entomology Advisor…

- made 36 presentations to growers, pest control advisors, and homeowners regarding safe and effective methods for managing insect pests.
- wrote 41 publications, including 15 peer-reviewed publications (mostly through the University of California), 10 technical reports and articles, and 25 popular press articles that were published in trade journals, newsletters, newspapers, and grower publications.
- provided an insect booth during a two-day period to over 1,500 elementary school children at the Farm Bureau's annual Farm Day in the City.

Environmental Horticulture/Environmental Science

John Karlik, Advisor

Kern County Outreach:

MASTER GARDENER CLASSES

The climate and relative affordability of housing in Kern County allow individuals to practice horticulture at home, to improve the environment, improve aesthetic qualities of their neighborhood, and produce food at home. A large commercial landscape industry also exists.

Two 16-week Master Gardener classes were held during fall, 2007

- Master Gardener I class with an enrollment of 35
- Master Gardener III class with an enrollment of 21

Topics discussed included:

- Soil properties and their modification
- Plant selection and placement
- Tree planting and staking
- Pruning practices
- Small-scale fruit, citrus, and vegetable production
- Irrigation and water conservation
- Non-chemical pest management
- Plants and air quality

Kern County is the only county in California in which a series of Master Gardener classes is offered.

Impact:

Presentation of up-to-date horticultural information for Kern County.

Visiting speaker, UC advisor Craig Kallsen, discusses budding and grafting at a Master Gardener class.

PRUNING DEMONSTRATIONS FOR FRUIT TREES

Collaborator: Mario Viveros, advisor emeritus, UCCE Kern County

The climate of Kern County allows a greater range of home fruit trees species to be grown than in many locations. To maintain yield and prolong tree life, pruning is necessary for deciduous fruit trees. However, it is difficult to teach or to learn pruning in a classroom setting or from photographs or books. Therefore, we offer these free demonstrations on an annual basis for all interested Kern County residents. We also make available fruit tree publications we wrote, which were printed through the county reprographics service. Two pruning demonstrations were held in December.

Impact:

Improved pruning practices for fruit trees.

PRUNING EXPERIMENTS FOR REDUCING WIND-LOADING IN SHADE TREES

Pruning is one of the most important cultural practices in the management of trees. One important reason for pruning is to reduce leaf area (crown thinning) in order to reduce aerodynamic drag, which may cause limb breakage and wind-throwing in storms. However, the decrease in aerodynamic drag through the reduction of the cross-sectional areas of leaves and branches is not well understood, and to our knowledge has not been quantitatively described. We made measurements of force exerted by an artificial wind after removal of increasing amounts of leaf and branch area. Data are still being analyzed, but we found that more drag force was associated with tree leaves than we expected.

Plant crown is thinned prior to measurement of wind loading.

Impact:

The results will be used to develop pruning recommendations to reduce limb breakage and tree failure due to wind.

4-H Youth Development Program

John Borba, Advisor

Program Description:

4-H is a nationally recognized youth development program which promotes citizenship, leadership, and life skills. In California, the program is administered by the University of California Cooperative Extension. 4-H is open to youth five through nineteen years of age. Kern County hosts more than 40 traditional clubs which serve more than 1000 members and 400 leaders. In addition to the club program, special outreach projects are offered to both urban and rural youth.

Highlights:

TECHNOLOGY TRAINING GIS/GPS

The National 4-H Council has placed an emphasis on increasing the proficiency of America's youth in Science, Engineering, and Technology (SET). The Kern County 4-H program, in cooperation with the Kern County Ag Commissioner's Office, has taken steps to address this situation. The 4-H program secured an Environmental Systems Research Institute (ESRI) grant which allowed the purchase of Geographic Information Systems (GIS) software and Global Positioning Systems (GPS) handheld units.

4-H members learning the basics of GPS & GIS technology.

Extension Methods:

With technical support from the Ag Commissioner's Office, training on both systems is being provided to 4-H members and their adult family members. Participants are receiving hands-on instruction of the systems by learning to plot coordinates and applying the data to create plot maps.

Results/Impacts:

A cadre of youth is receiving instruction that will allow them to serve as youth trainers to other 4-H members in the County as well as enter the workforce with skills, knowledge, and abilities in GIS/GPS technology.

4-H CAMPING TASK FORCE/CAMP EVALUATION RESEARCH

Numerous counties in California offer residential camps as part of their 4-H program. The Camping Task Force was created to promote positive youth development practices for those offering camps. The Task Force has been active in research, education, and publication of curriculum to benefit 4-H camp programs.

Extension Methods:

4-H members at twelve camps located throughout the state, including Kern, were surveyed to evaluate their camp experiences in regards to belonging, skill building, and safety. The data was compiled and presented to the camp organizers so they could implement changes to make their camps better. Also, members of the Task Force organized a camping conference for youth and adults to educate them about matters such as safety, risk management, and youth/adult partnerships.

Results/Impacts:

Two of the camps involved in the survey implemented changes in their camps from the information taken in the surveys. Eighty 4-H members and leaders from throughout California, including a delegation from Kern, attended the 2007 Camping Conference to improve their knowledge of best practices regarding residential camps.

TEENS MAKING DECISIONS

Motor vehicle accidents are the leading cause of death among teenagers. Teen fatalities from car crashes are three times higher in the Central Valley than in any other part of the State according to the National Highway Traffic Safety Administration. This project is designed to learn more about the early experiences young people have with driving and their perceptions about driving habits.

Extension Methods:

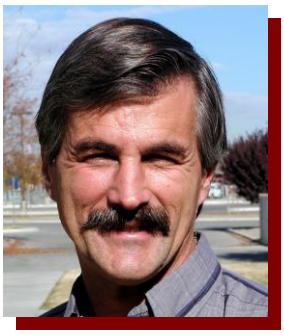
High school seniors from several Central Valley high schools were interviewed in focus groups to develop questions regarding driving habits for a teen survey. Students from Ridgeview High School participated in two focus group interview sessions. The data provided from these interviews provided the basis for survey development for the research team. Surveys were administered to thirteen high schools in seven California counties, including Kern.

Results/Impacts:

The data from the surveys has been compiled and researchers have been reviewing the results. Several newspapers have distributed the results and presentations on the findings have been given at several national conferences. Ongoing projects regarding distribution of the data and development of educational tools for teens and parents are being planned.

Irrigation and Agronomy

Blake Sanden, Farm Advisor



General Program Summary

IRRIGATION & SOILS

This portion of my program focuses on two major areas:

1) Irrigation system management - optimizing efficiency and profitable water use
2) Salinity/fertility management - crop salt tolerance, soil quality, amendments and nutrient availability

AGRONOMY

Research and advising on all phases of production of alfalfa and forage crops, dry beans, sugar beets and safflower. Grower consultations to identify problems. Develop improved varieties.

Educational & Professional Outreach For 2007

Methods: Presentations at field meetings and workshops plus individual consultation through farm and phone calls.

Impacts:

- 4 Kern County meetings/workshops
- 5 other county meetings
- 17 professional society meetings
- 1 international consulting trip
- 4 newsletters, 1 popular press article
- 95 farm calls and office consultations
- 1530 people served

IRRIGATION MANAGEMENT & MONITORING (ON-GOING PROJECTS)

Situation: Increased water costs, variable field characteristics and crop water consumption mean growers have to be more efficient. New technology for field water monitoring developed in the last 8 years can be very helpful and confusing to growers.

Methods: Install/demonstrate a simple logger and soil moisture sensor combination paid for by growers. Document irrigation efficiency and "user friendliness" of technology. Conduct workshops.

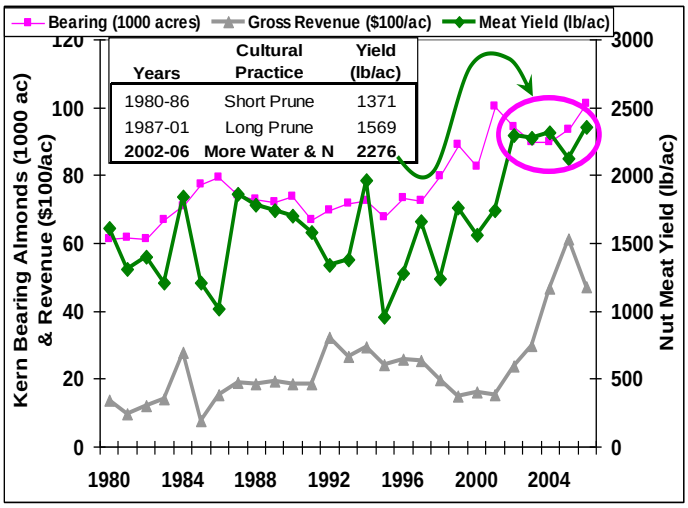
Impacts:

- Monitoring, loggers/sensors installed:
  - 12,380 acres over 140 fields
  - 33 different growers
  - 14 different crops
  - 11 soil textures
  - 9 different irrigation system types
  - Average water use efficiency: 95%

WATER USE & DEFICIT IRRIGATION IN ALFALFA AND ALMONDS

Situation: Urban water demand in California is increasing. New dams and supply are not being developed. Increased demand is being met through ag and urban water conservation. Almonds and alfalfa consume more than 5 million ac-ft (MAF)/year. Accurate understanding of optimal water use is essential to maximize efficiency and identify yield loss to the crop under deficit irrigation.

Methods: Using data from the "Monitoring" project and specific field trials, identify "crop coefficients" from actual almond and alfalfa water use for the southern San Joaquin Valley and measure production losses under deficits.



Impacts: Average water use in almonds has increased by 15 to 20% over the last 15 years due to improved irrigation management; increasing average yields by 50% (above chart). While this takes more water the net efficiency of yield/gallon of water has increased. Our studies show that alfalfa irrigation can be stopped in July and August, losing 1 ton/ac yield that year, but fully recover the following season. Following this practice for drought conditions in 2008 could free up 200,000 ac-ft of water in the SJV for use on other crops of higher value.

SALINITY, CROP TOLERANCE AND ORCHARD DEVELOPMENT

Situation: More than ½ million acres in the San Joaquin Valley have salinity problems—often associated with ground-water that contains excess salts. Low value field crops like safflower, grain and cotton have been the traditional crops. But to remain profitable growers are planting trees and vines. UCCE research establishing salinity tolerance thresholds and practical irrigation techniques using saline water keep growers in business as urban demand for fresh water and "legislative" droughts reduce deliveries to ag.

Methods: One 9-year small plot study in Kings County showed that pistachios were as salt tolerant as cotton. A 10-year trial planted March 2005 over a 300 acre production field irrigated with buried drip tape will establish the viability of developing pistachios using well water that is 10 times the salinity of the California Aqueduct. This irrigation water is twice the salinity used on any other pistachio orchard currently.

Impacts:

- Pistachios appear to be 5 times more salt tolerant than almonds.
- About 18,000 acres of pistachios currently planted to saline soils, much of it as a result of my consultation.
- An additional 40,000 acres likely to be planted in the next 5 years.

Nutrition, Family and Consumer Science

Margaret Johns, Advisor

EATFIT PROGRAM

Eat*fit* is a nutrition education intervention designed for middle school-aged children. The idea for this curriculum originated in Kern County after talking to middle school P.E. Teachers in the Shafter and Panama-Buena Vista School Districts. Focus group interviews were conducted with middle school students in the Lamont School District. The initial pilot testing of the curriculum was conducted with 700 students at Thompson Jr. High School in the Panama-Buena Vista School District.

The Eat*fit* program is a goal-oriented intervention that challenges adolescents to improve their eating and fitness choices, as well as improving student achievement of selected 6th grade content standards in math and language arts. The program consists of student workbooks, teacher curriculum, and the use of the website and dietary analysis found at www.eatfit.net.

The curriculum consists of nine hands-on, experiential lessons covering topics such as; goal setting, label reading, fast food, breakfast, exercise, energy balance and advertising. This program engages students in a computerized personal self-assessment of eating and physical activity behaviors. Based on the personalized assessment, students set goals and the curriculum provides skill-building activities to help reach those goals.

Extension Methods:

The Youth EFNEP Coordinator provided training to the physical education teachers at two middle schools in the Lamont School District. The teachers taught the Eat*fit* curriculum to 520 students. Pre-and post-test data was collected and is currently being analyzed by U.C. Cooperative Extension.

Results/Impacts:

Preliminary evaluation results from nine classes show the youth improved their knowledge by 54 percent, food selection skills by 66 percent and improved their healthy eating behaviors by 50 percent.

SURVIVAL OF THE FITTEST

This project was done in collaboration with a leadership team from the Network for Children's Leadership training program. We held an event a Saturday in June for older Foster Youth close to emancipation. The event consisted of classes in nutrition education, cooking and money management. In the morning the participants rotated through the nutrition education and cooking classes. When participating in the nutrition classes, the youth learned about whole grains and eating more fruits and vegetables. About 20 youth attended each class.

All of the youth participated in the cooking classes which prepared the lunch meal for the program. The menu consisted of fruit salad, broccoli salad, Mexican fiesta rice, hamburger heaven and stir fry. The cooking went well and many youth came back for seconds. The afternoon session consisted of learning about goal setting, choices and managing money.

Extension Methods:

Extension Nutrition Educators and the Nutrition, Family and Consumer Science Advisor taught the classes and the Leadership Team supervised the youth with the food preparation. A retrospective post-then-pre test was administered at the end of the program.

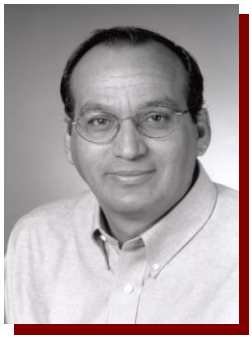
Results/Impacts:

Participants gained a 23% increase in knowledge in cooking, 24% increase in nutrition, and a 26% increase in goal setting, choices and money management. On a scale of 1 to 5 with 5 being *Very Much Worth My Time*, the participants rated the program a 4.2. Participant comments from the evaluation indicated youth intended to cook healthier and better manage their money.

Vegetable Crops/Plant Pathology

Joe Nunez, Farm Advisor

Program Description:



There are approximately 32 different vegetables planted for commercial production on over 91,000 acres of Kern County farmland with a total value of over $330 million.

As the vegetable advisor, it is my responsibility to identify, prioritize and meet the needs of the vegetable industry by establishing an applied research program to solve local vegetable production problems. I extend new research based information with an ongoing education outreach program through the use of meetings, newsletters, farm calls, and mass media. In addition, I help answer questions and solve problems for the general public in areas that I have some expertise.

TOMATOES

Tomatoes are the leading processed vegetable crop in California. Annual production is about 10 million tons of fruit, grown on more than 260,000 acres and with a total on-farm value exceeding $608 million. Kern County growers harvested 995,200 tons of processing tomatoes grown on 25,400 acres. Processing tomatoes are grown throughout the state and in many soil and temperature regimes. Under such diverse growing conditions, the performance of different varieties also varies greatly. By participating in the Uniform Statewide Processing Tomato Variety Trial we are able to determine which tomato varieties will grow best in Kern County.

Tomato Variety Trial Harvest

Applied Research:

A variety trial is conducted each year in March on a grower's field. Trials of both early and mid-season cultivars are now performed annually in six to eight counties. They include both replicated variety plantings and experimental lines not yet ready for commercial release. The results benefit the entire industry by providing unbiased information on which to make variety decisions. The same varieties are planted throughout the state in different processing tomato growing counties. Transplants are planted in the grower's field and receive all the same inputs as the grower's field. In August the trial is sub-sampled and the tomatoes are taken to a lab to determine pH, color, and brix (sugar content) of the fruit. The entire plot is then harvested and the yields recorded for each replicated variety.

Extension of Information:

The results of the trial are sent to the local processing plant and released in my newsletter to all my clientele. All this information is then integrated, analyzed and reported in newsletters, reports, meetings, the California Tomato Grower magazine and other media.

Results/Impacts:

In 1973, when the trials started in three counties, average yields were 20.0 tons per acre in Kern County. In 1997, yields had increased to almost 40.9 tons per acre. As overall production in the county has expanded, so has the variety evaluation. Additionally, the trials foster support and cooperation among UCCE, growers and processors.

SUSTAINABLE POTATO–CARROT ROTATION

Carrots and potatoes are two of the most widely grown vegetables in the San Joaquin Valley of California. The great majority of these crops are grown on farms that utilize fungicides and fumigants to manage diseases caused by soilborne pathogens. Several environmental and economic concerns accompany the over-reliance of these chemicals. Both carrot and potato culture in the San Joaquin Valley rely heavily on pre-plant soil treatment with metam-sodium, an important component of the total agricultural volatile organic compound (VOC) inventory in the state. Currently, the state is not meeting the court ordered mandate to reduce VOCs to 20% of 1991 levels.

In this study, the influence of conventionally, organically, or bio-intensively managed production systems for potato and carrot will be studied over a two-year period. The influence of microbial activity and species diversity on damage caused by root knot nematodes, are included in the evaluation of these production systems. The influence of conventional synthetic fertilizers and organic soil amendments, on microbial community dynamics will be determined.

It is expected that higher microbial activity will result in reduced disease and possibly reduced populations of soilborne pathogens by the end of the study. The processes that create disease suppressive soils can be better understood when a whole examination of field ecosystems is included. The end results may include less reliance on fungicides and fumigants, a more sustainable method of farming that utilizes more organic sources of nitrogen rather than synthetic inputs, and generally a more sustainable way of growing these crops in the San Joaquin Valley with fewer long-term environmental problems.

Growing legume cover crop for sustainability trial.

Applied Research:

A trial has been started in which legume cover crops will be grown between crops of carrots and potatoes. That will be compared to a conventional system of using synthetic fertilizers with no addition of organic matter to the soil. An in-between treatment will also be evaluated in which synthetic fertilizers will be used along with addition of organic matter to the soil. The cover crop was planted in October 2007 and will be incorporated into the soil in January 2008. Soon after that potatoes will be planted and the resulting crop will be evaluated for yield and disease. The plots will be monitored for soil respiration, microbial activity, enumeration of fungi, bacteria, and nematodes.

Extension of Information:

The results will be given at meetings, through newsletters, reports, and a journal paper at the completion of this two-year project.

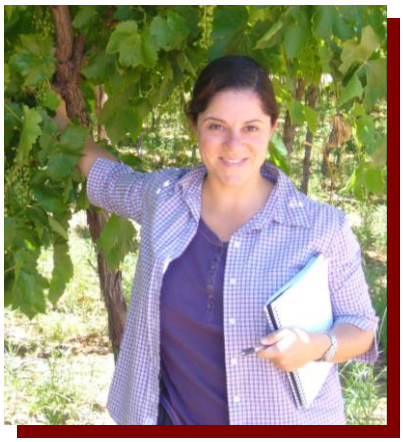
Results/Impacts:

We hope that at the completion of this project we can recommend to growers how to farm in a more sustainable manner that would require less inputs from synthetic fertilizers and pesticides. The impacts will be significant if we can achieve our goals because this will help reduce emissions of CO_2 of VOCs into the atmosphere.

Viticulture

Jennifer Hashim-Buckey, Farm Advisor

Program Description:



The Viticulture Farm Advisor provides a broad based, off-campus education and research program in the fields of viticulture (with an emphasis on table and wine grapes), small fruits production, post-harvest handling and pest/pathogen management for local growers, agricultural associations, governmental agencies and homeowners in Kern County. Major duties include providing information to grape growers on the latest and most efficient means of production viticulture and pest management through a variety of methods such as newsletters, media, consultations and commodity meetings.

Projects or Applied Research:

MONITORING & CONTROL MEASURES FOR PIERCE'S DISEASE IN KERN COUNTY

In 2001, we developed a project to track and map the progression of Pierce's disease (PD), a lethal bacterial disease of grapevines, over time in approximately 6,000 acres of vineyard in Kern County. The monitoring program was prompted by a significant increase in the Glassy-winged sharpshooter (GWSS) population, an effective vector of the disease, in citrus and grape-growing areas of Kern County and recent exposure of the devastating losses caused by the pest-disease complex in the grape-growing areas of Temecula, CA.

Extension of Information:

Pierce's disease updates have been presented at the 2007 Kern County Grape Pest Management Seminar, the annual CDFA Pierce's Disease Symposium and at monthly pest and disease control district meetings held in Delano. A newsletter has also been developed to remind growers that annual pest monitoring is essential to their vineyard program.

Symptoms of Pierce's disease appear as water stress, caused by the blockage of water conducting tissues.

Results and Impacts:

Following our multi-year project, we demonstrated that annual monitoring and removal of PD+ grapevines, in combination with an area-wide Glassy-winged sharpshooter treatment program, could produce significant year-over-year declines in PD incidence (up to an 83% reduction). The monitoring program produced useful baseline and historical information on the incidence and distribution of PD in Kern County.

EVALUATION OF ACARICIDES FOR REDUCTION OF WEBSPINNING MITES IN VINEYARDS

Webspinning spider mites are a nuisance to grape growers as they feed on the leaves of grapevines. Heavy feeding can render leaves non-functional and some defoliation can occur. Damage to the grapevine canopy by spider mites can have adverse effects on table grape quality by causing ambering and sunburn on exposed fruit. During the summer of 2007, a trial was conducted south of Arvin to determine the effects of acaricides on the density of Willamette spider mite, Eotetranychus willamettei Ewing, on wine grapes.

Extension of Information:

Results of the trial were distributed to all cooperators on the project. An abstract summarizing the project will also be published in Arthropod Management Tests 2008, an annual publication by the Entomological Society of America that reports on preliminary and routine screening tests for management of harmful and beneficial arthropods.

Results and Impacts:

The information developed from this project will offer growers more cost effective and safer alternatives for mite control in the vineyard without sacrificing performance.

CULTURAL PRACTICES FOR SUMMER ROYAL TABLE GRAPES

'Summer Royal' is a mid-season black seedless cultivar developed by USDA-ARS and released in 1999. While some work on the effects of gibberellic acid (GA) applications at fruit set on fruit growth and color has been evaluated, no work on the effects of forchlorfenuron (CPPU), a synthetic plant growth hormone that stimulates cell division and elongation and results in significant increases in berry size, has been published. A project was created to examine the effects of CPPU, registered in 2005 under the name of Prestige, alone and in combinations with GA at berry set on fruit size and quality.

'Summer Royal' table grapes.

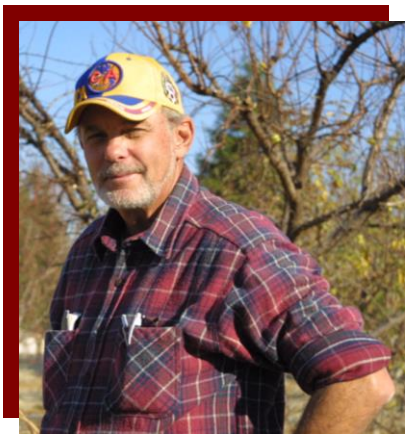
Extension of Information:

Results of this project were presented at a local grower meeting during the spring and also in individual field and phone consultations.

Results and Impacts:

Results from this project indicated that a 33% increase in the size of 'Summer Royal' berries could be achieved by treating fruit with GA or CPPU alone (10 grams/acre) at berry set or in combination treatments of GA and CPPU (10 g/ac + 6,8,10 g/ac). However, it was observed that rates of CPPU used in this experiment had detrimental effects on color development and the preliminary treatment recommendation is GA only at 10 grams/acre at berry set. Since this is the only growth regulator trial on 'Summer Royal,' the results will be helpful to growers and farm advisors who work with table grape growers.

Support Team



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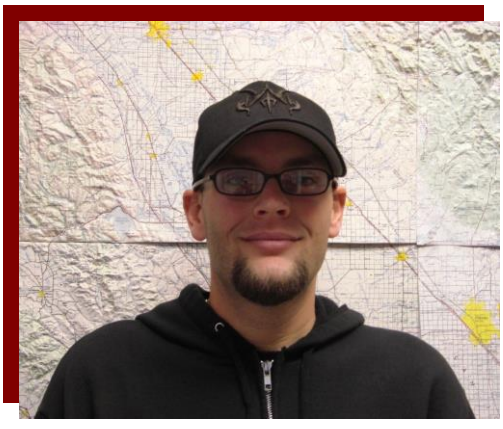

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UC COOPERATIVE EXTENSION
KERN COUNTY FARM AND HOME ADVISORS
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